INTEGRATED STEREO AMPLIFIER

SA-8500

OPERATING INSTRUCTIONS

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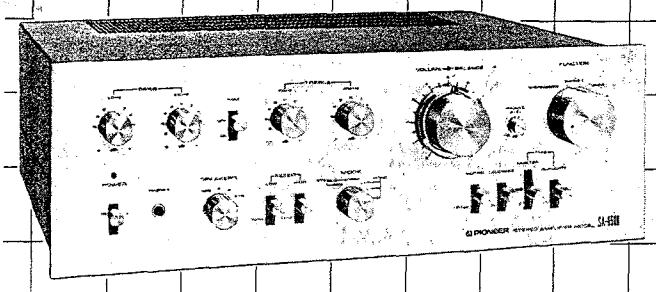

PIONEER

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FEATURES

Power Amplifier

The SA-8500 employs high reliability NPN & PNP silicon power transistors. Together with the differential first stage, all stages are direct coupled in a pure complementary OCL circuit configuration. Careful circuit design and selection of components results in a wide output bandwidth.

Extremely Close RIAA Equalization

RIAA deviation, which governs record playback fidelity, is reduced to very close tolerance by stringently selected equalizer elements. A dual DC power supply system is also employed to provide increased acceptable input volume, resulting in expanded dynamic range and faithful record performance at low distortion. The PHONO 2 jacks are equipped with a convenient level control. This permits the level to be adjusted to match that of the cartridge connected to the PHONO 1 jacks.

Capable of Delicate Tone Adjustments

PIONEER developed twin tone control circuits are applied to conventional BASS and TREBLE controls. Independent controls are provided for ultra low and ultra high frequencies, allowing fine tone adjustments to be performed according to room acoustics or cartridge frequency characteristics. A TONE switch is also included to permit comparing the effectiveness of the tone controls.

Protection Circuit

Electronic circuitry and a relay are combined in a fast action protection circuit which guards transistors and speakers from damage in the event of defective connections, such as speaker terminal shorting. When DC current appears in the output, the output circuit is instantly opened. The protection circuit also performs a muting function when the power switch is operated.

Program Sources which can be Enjoyed

Stereo input jacks are provided on the rear panel for two turntables, two tape decks, a tuner, an auxiliary program source plus a microphone, allowing for great flexibility in operation.

Easy Tape Duplication

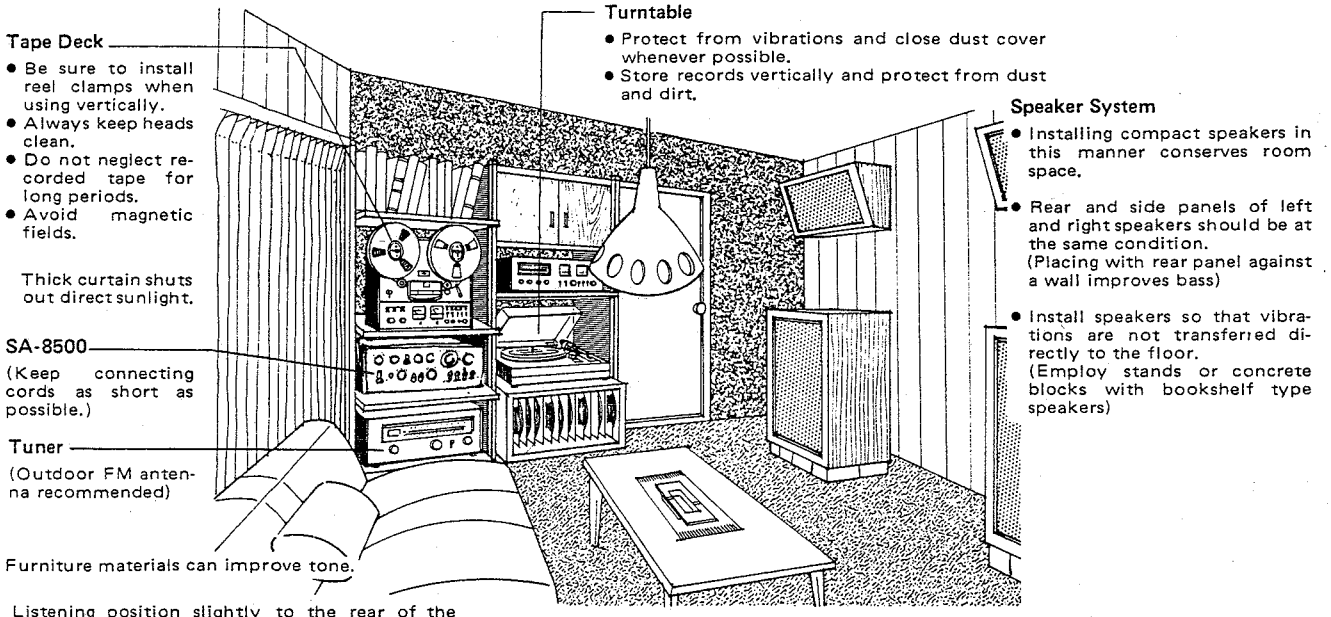
By connecting two tape decks, the desired programs only can be edited from a recorded tape. The convenient DUPLICATE switch also allows duplication from open reel to cassette tape formats.

Elegant Styling Complements Performance

The front panel of this new Pioneer stereo amplifier has been designed to combine ease of operation with handsome appearance.

STEREO SYSTEM COMPOSITION

- Do not place equipment in locations that are unlevel or subject to vibration.
- Allow for good rear panel ventilation of components; avoid humidity and dust.
- Keep equipment away from radiators or other heat sources.


Tape Deck
• Be sure to install reel clamps when using vertically.
• Always keep heads clean.
• Do not neglect recorded tape for long periods.
• Avoid magnetic fields.
Thick curtain shuts out direct sunlight.
SA-8500
(Keep connecting cords as short as possible.)
Tuner
(Outdoor FM antenna recommended)
Furniture materials can improve tone.
Listening position slightly to the rear of the apex of an equilateral triangle formed with left and right speakers.
Turntable
• Protect from vibrations and close dust cover whenever possible.
• Store records vertically and protect from dust and dirt.
Speaker System
• Installing compact speakers in this manner conserves room space.
• Rear and side panels of left and right speakers should be at the same condition. (Placing with rear panel against a wall improves bass)
• Install speakers so that vibrations are not transferred directly to the floor. (Employ stands or concrete blocks with bookshelf type speakers)
Carpet
Absorbs sound and vibrations.
(Placing in front of speakers also effective)

LINE VOLTAGE FUSE

SA-8500 amplifier are designed to accept different line voltages, according to the country in which they are to be used, although the operation of the various models in the same in every other respect. The line voltage connection is on the rear panel, Fig. A shows the line voltage connection of a model designed to operate at 220V only.
Fig. B shows the line voltage selector and fuse of a model designed to operate at any of five preselected voltages (110V, 120V, 130V, 220V, 240V).

CHANGING LINE VOLTAGE SETTING AND FUSE

To remove the fuse, unscrew the fuse cap located in the center of the line voltage selector and withdraw it, together with the fuse. Next, pull the line voltage selector plug out of its socket, rotate it until the cutaway aligns with the appropriate line voltage marked on the back of the unit, then push it back into its socket. It is important to check the rating of the fuse; a 2.5A fuse should be used with either 220V or 240V, while a 5A fuse should be used for 110V, 120V or 130V operation. If the fuse rating is correct, replace it and screw in the fuse cap.

FUSE REPLACEMENT

When the fuse blows, remove the fuse cap and replace the fuse with a new one. Fig. C.

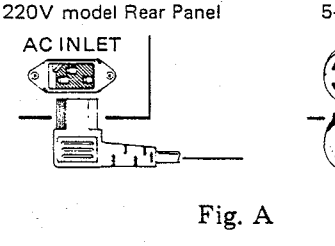


Fig. A

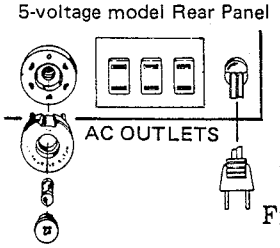


Fig. B

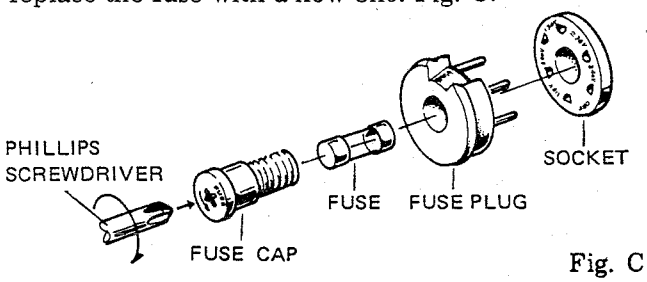
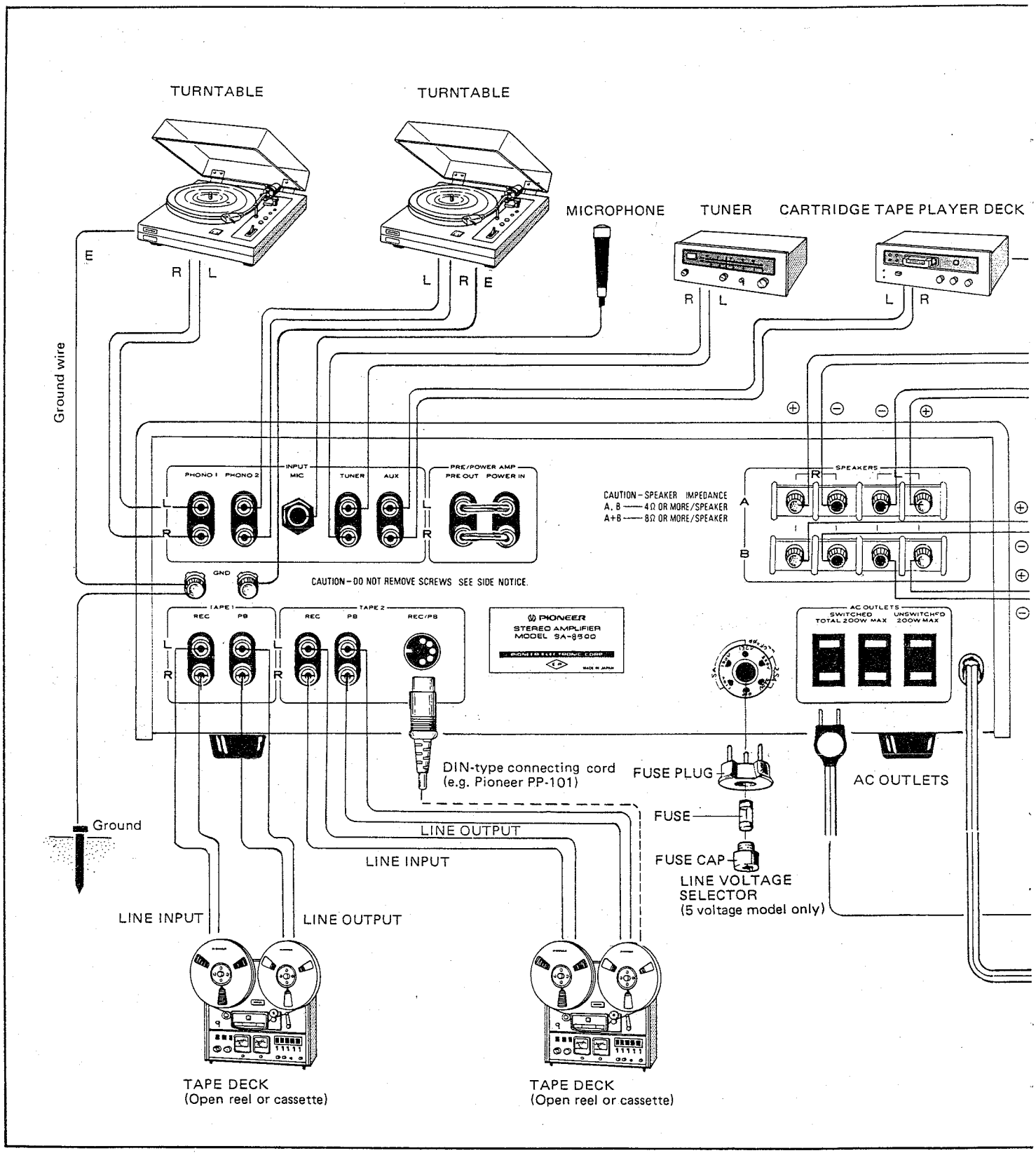
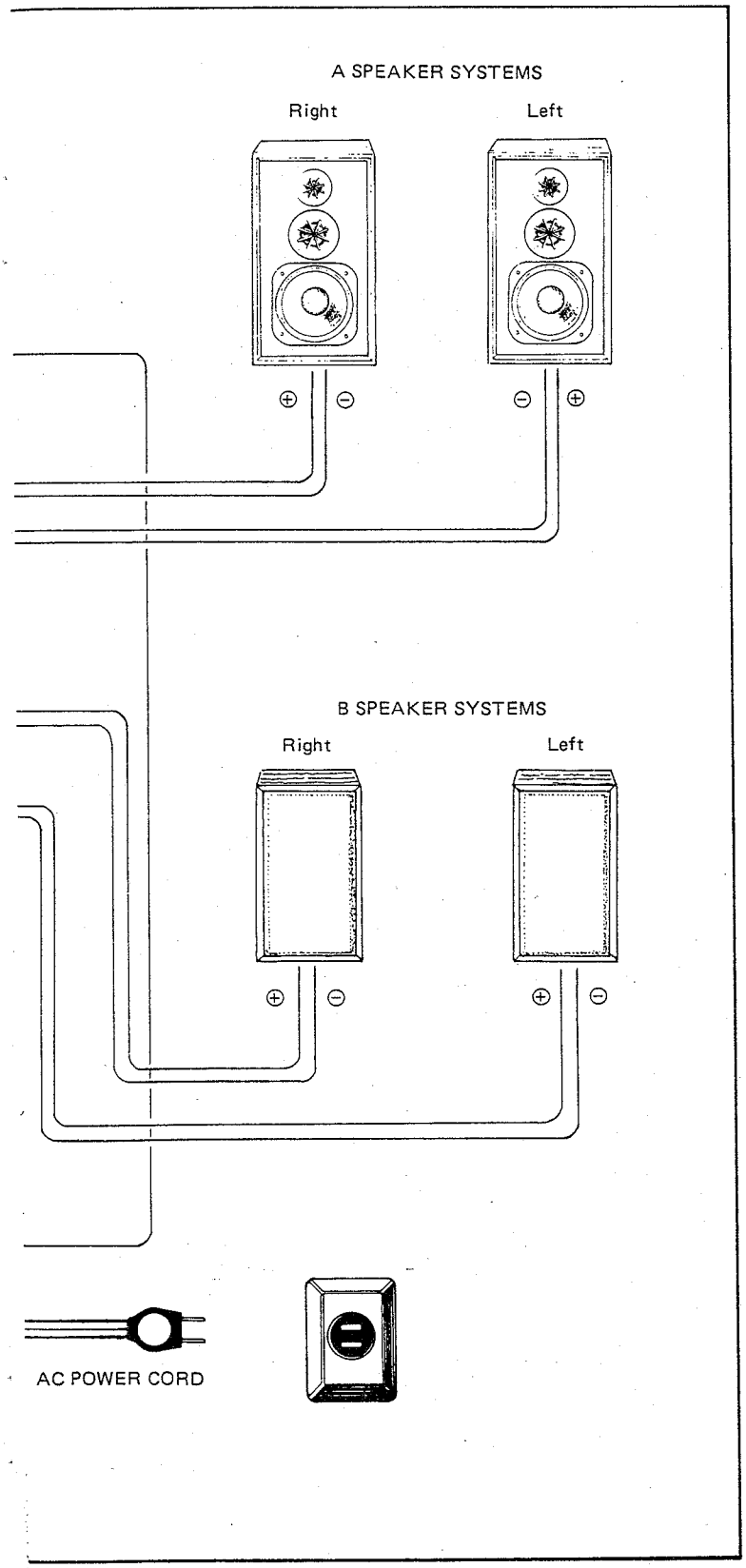


Fig. C

CONNECTION DIAGRAM





Using AC Outlets

These can be used to supply AC power to other components, such as tuner, turntable, tape deck, etc.

SWITCHED: AC power to component plugged into this outlet is coupled with the SA-8500 POWER switch setting. Maximum 200W total.

UNSWITCHED: AC power always present at this outlet, regardless of POWER switch setting. Maximum 200W.

Connecting Precautions

- Observe both the channels and polarities of the inputs and outputs of the components connected to the SA-8500. Be sure to connect L to L, R to R, + to +, and – to –.
- Make all connections securely.
  Loose connections can cause noise or loss of sound.

CONNECTIONS

SPEAKER SYSTEM

The SA-8500 is provided with 2 sets of speaker output terminals, A and B. A pair of speakers should normally be connected to the A terminals.

- As shown in Fig. 1, connect the right channel (as viewed from the front) speaker to the R terminals, and the left channel speaker to the L terminals.
- Observe plus (+: red) and minus (−: black) polarities of the output terminals and those of the speakers. When making connections take care to connect + to + and − to − between the speakers and the SA-8500 speaker terminals.

NOTE:
If 2 sets of speaker systems (A & B) are to be used simultaneously, be sure that all speakers systems are 8Ω or more in impedance. Damage may be caused of if speakers of less than 8Ω are employed.

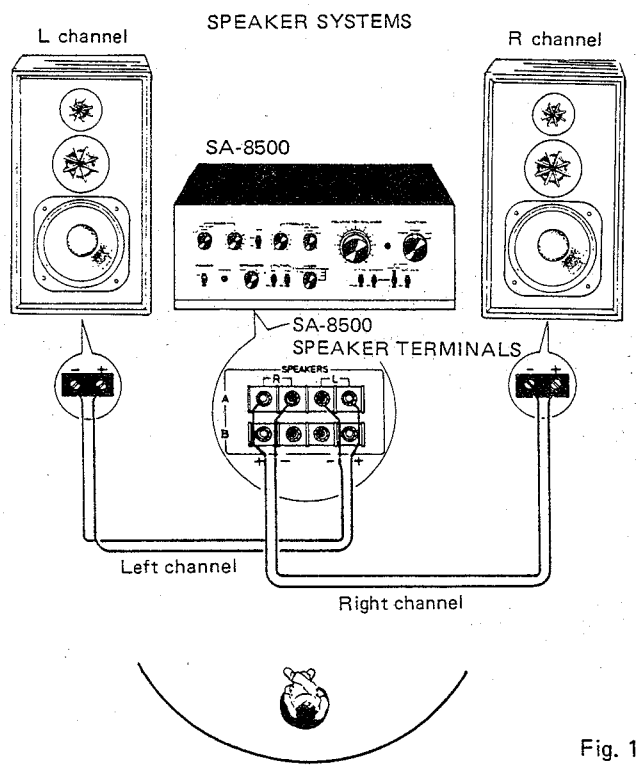


Fig. 1

TURNTABLE

Connect turntable outputs to the PHONO 1 jacks, and ground wire to the GND terminal.

NOTES:
1. *A moving magnet (MM) type cartridge can be directly connected; however, a low output moving coil (MC) cartridge requires an accessory matching transformer or head amplifier.*
2. *A second turntable can be connected to the PHONO 2 jacks.*

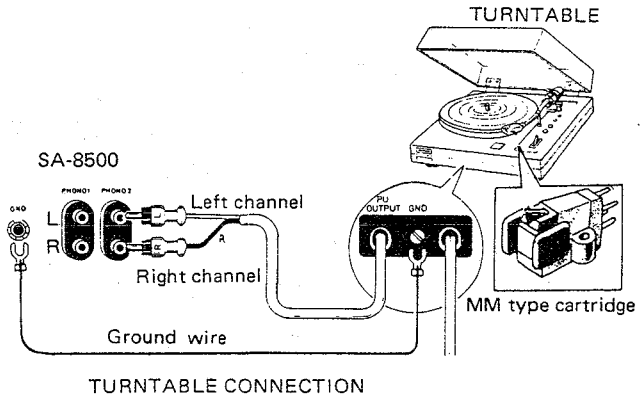


Fig. 2

TUNER

Connect an AM/FM stereo tuner to the TUNER jacks.

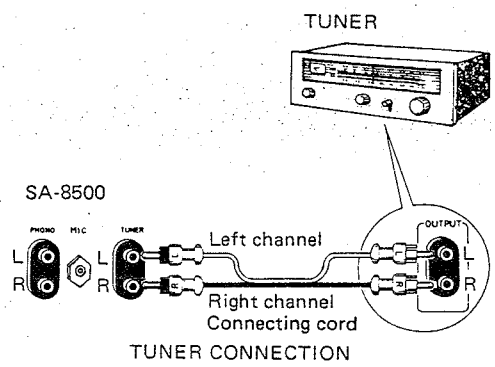


Fig. 3

AUX TERMINALS

These jacks are for auxiliary inputs. They can be used to connect a cartridge tape player deck, second tuner, or other source.

TAPE DECK (OPEN REEL OR CASSETTE)

The SA-8500 is provided with 2 sets of recording (TAPE 1 & 2 REC) and playback (TAPE 1 & 2 PB) jacks plus a DIN type recording/playback connector (TAPE 2 REC/PB). Connect as follows:

Recording Connections

Connect tape deck recording terminals (LINE INPUT) with the TAPE 1 REC jacks.

Playback Connections

Connect the tape deck playback terminals (LINE OUTPUT) with the TAPE PB jacks.

NOTE:

1. *Connect a second tape deck to the TAPE 2 (REC & PB) jacks.*
2. *Employ connecting cords supplied with tape deck.*

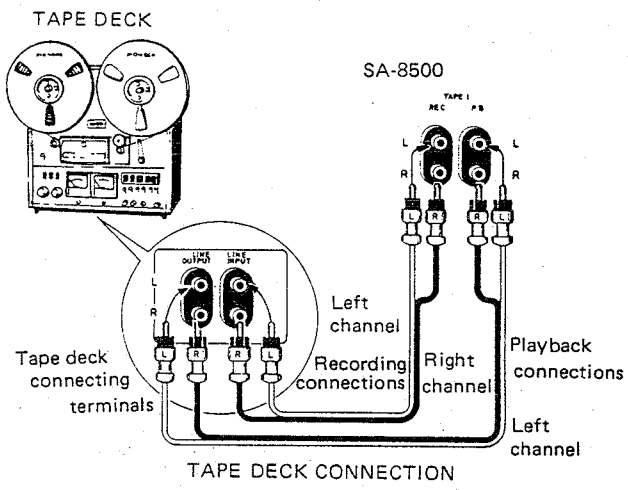


Fig. 4

Connection Via TAPE 2 REC/PB Connector

Instead of the recording and playback connection just described, the tape deck can be connected to the TAPE 2 REC/PB connector (DIN type) of the SA-8500 provided an identical connector is fitted to the tape deck. The single DIN-cable completes all playback and recording connections at the same time.

Note that the TAPE 2 REC/PB connector corresponds to TAPE 2 PB and TAPE 2 REC jacks — the signal must be controlled by means of the TAPE MONITOR switch on the SA-8500.

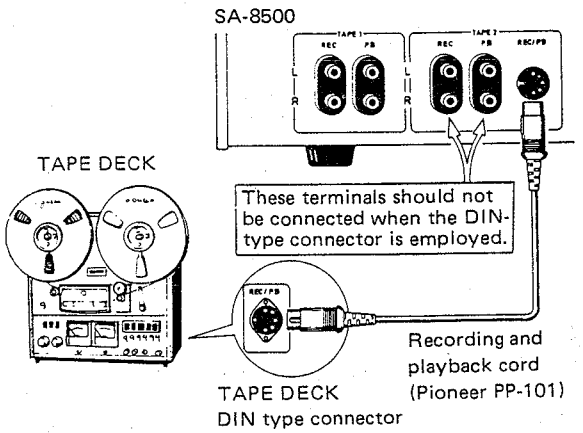

SA-8500
TAPE DECK
These terminals should not be connected when the DIN-type connector is employed.
Recording and playback cord (Pioneer PP-101)
TAPE DECK
DIN type connector

Fig. 5

FRONT PANEL FACILITIES

BASS TWIN CONTROL

Adjusts low frequency tone.

100 Hz: Adjusts frequency band below 400Hz. Control effectiveness at 100Hz is ± 8dB by 2dB step.

50Hz: Provides additional control to the 100Hz knob for the frequency band below 200Hz. Control effectiveness at 50Hz is ± 6dB by 2dB step.

TONE SWITCH

When set to OFF, the tone control circuit is disengaged and a flat frequency response obtained. The tone controls (BASS & TREBLE) do not function in this case. This switch is convenient for various kinds of checking, including cartridge and speaker tone, tone control effectiveness, and listening room acoustics.

PILOT LAMP

Lights to indicate power ON.

POWER SWITCH

Switch for turning on power. When switched ON, sound is not immediately obtained from the speakers. This is due to the operation of the internal muting circuit and does not signify malfunction.

PHONES JACK

Plug stereo headphones into this jack for private listening.

NOTE:
Set the SPEAKERS switch to OFF when listening through the headphones only.

SPEAKERS SWITCH

OFF: Speaker sound cut off

A: Activates speakers connected to the 'A' SPEAKERS terminals

B: Activates speakers connected to the 'B' SPEAKERS terminals

A + B: Sound obtained from both A and B speaker systems

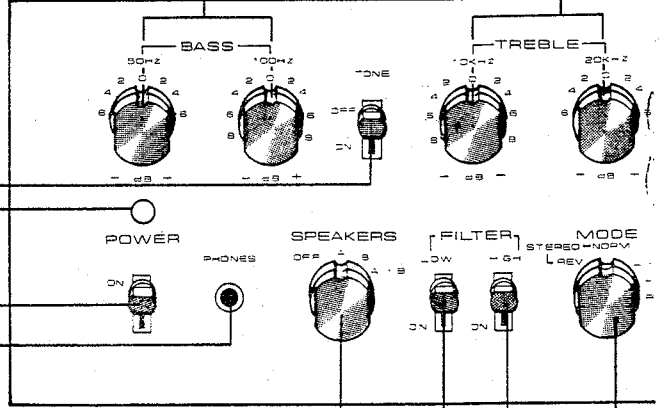
NOTE:
Set switch to OFF when listening only through headphones, or to temporarily interrupt the sound.

TREBLE TWIN CONTROL

Adjusts high frequency tone.

10kHz: Adjusts frequency band above 2.5kHz. Control effectiveness at 10kHz is ± 8dB by 2dB step.

20kHz: Provides additional control to the 10kHz knob for the frequency band above 5kHz. Control effectiveness at 20kHz is ± 6dB by 2dB step.



LOW FILTER SWITCH

Set to ON if low frequency noise, such as motor rumble or hum etc., becomes objectionable.

HIGH FILTER SWITCH

Set to ON if high frequency noise, such as record scratch noise etc., becomes objectionable.

MODE SWITCH

STEREO REV: Reverses left and right channels of a stereo signal and presents them stereophonically.

STEREO NORM: Set to this position for normal stereo listening.

MONO L + R: Left and right channels of the input signal are mixed and presented monophonically.

MONO L: Left channel input signal is presented monophonically from both left and right speakers.

MONO R: Right channel input signal is presented monophonically from both left and right speakers.

VOLUME CONTROL

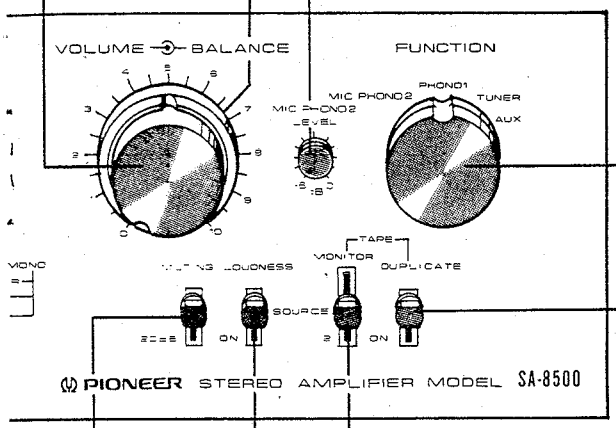
Adjusts volume from speakers or headphones. Clockwise rotation increases volume.

BALANCE CONTROL

Adjusts relative volume between left and right speaker systems or headphones. Clockwise rotation from center increases right channel volume, while counter-clockwise rotation increases left channel volume.

MIC/PHONO 2 LEVEL CONTROL

Adjusts sensitivity to PHONO 2 jacks and MIC jack.
See additional description on the next page.



FUNCTION SWITCH

Selects desired program source for listening.

PHONO 1: For playing records on a turntable connected to the PHONO 1 jacks.

MIC/PHONO 2: Same as above, for PHONO 2, or for reproduction through a microphone connected to the MIC jack on the rear panel. Note, when the microphone is connected to the jack, the turntable connected to the PHONO 2 jacks cannot be used.

TUNER: For listening to broadcasts through the tuner.

AUX : For playing signals fed to the AUX jacks.

LOUDNESS SWITCH

When listening at low volume, set this switch to ON to enhance low and high frequencies. The human ear possesses different characteristics when listening to low and high volume sounds. The LOUDNESS switch compensates for these characteristics.

TAPE DUPLICATE SWITCH

Set to ON when employing 2 tape decks to duplicate or edit recorded tapes.

MUTING SWITCH

Reduces volume by 20dB. Employ for temporarily reducing the volume, as when changing records or tapes. This eliminates the need for repeatedly adjusting the VOLUME control.

TAPE MONITOR SWITCH

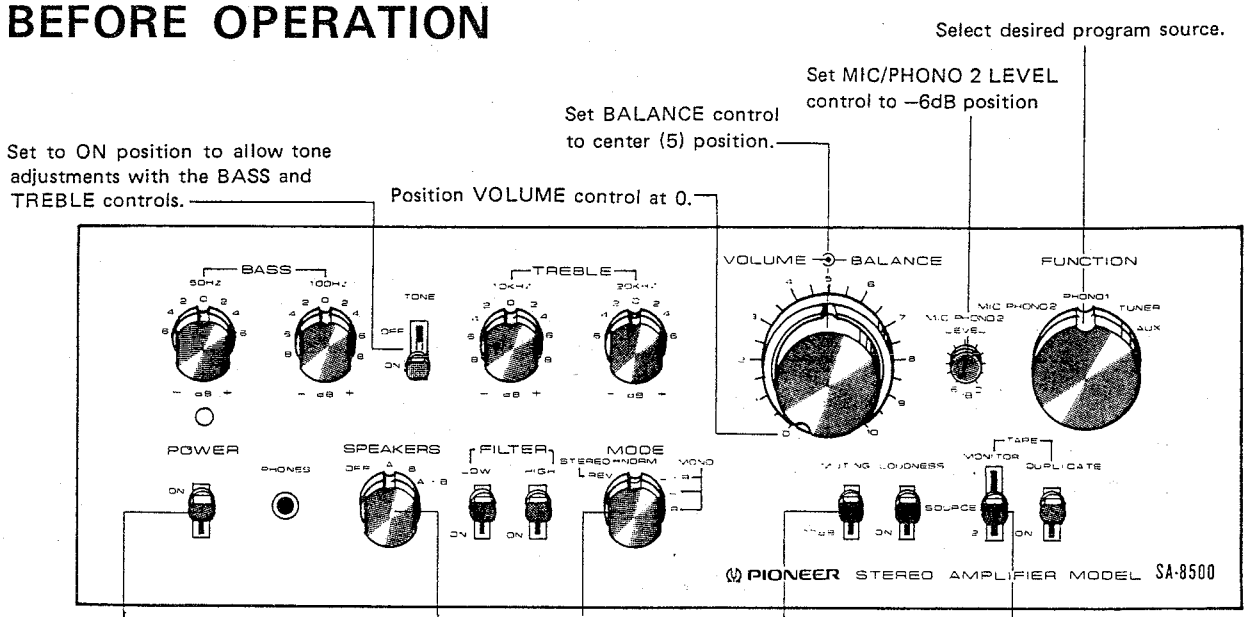
1: To perform tape playback or monitoring of tape deck connected to the TAPE 1 (REC & PB) jacks.

SOURCE: Set to this position when not playing tape.

2: To perform tape playback or monitoring of tape deck connected to the TAPE 2 (REC & PB) jacks.

NOTE:
Be sure to set this switch to SOURCE when employing turntable or tuner. Sound will not be obtained from the speakers at positions 1 and 2 in these cases.

BEFORE OPERATION



Set to NORM.

Set to A or B, according to the terminals to which speaker systems are connected.

Perform all other control and switch settings before turning on the power.

Set MUTING switch to upper position. At the –20dB position volume will be reduced.

Set to SOURCE. When playing tape on tape deck, set to 1 or 2 according to the jacks (TAPE 1 or TAPE 2) to which tape deck is connected.

OPERATION

PLAYING RECORDS

1. Set the FUNCTION switch to PHONO 1 if the turntable is connected to the PHONO 1 jacks, and to MIC/PHONO 2 if it is connected to the PHONO 2 jacks.
   Note, however, that the turntable connected to the PHONO 2 jacks cannot be used if the microphone is plugged into the MIC jack.
2. Play record on turntable.
3. Adjust the VOLUME, BASS and TREBLE controls for desired volume and tone.

Notes

- Lower the tonearm gently onto the record. Temporarily setting the MUTING switch to –20dB will reduce noise incurred at this time.
- Do not turn off the power while the stylus is in contact with the record.
- Avoid imparting vibration to the turntable while a record is being played. This may cause the stylus to jump and possibly damage the record.
- Howling may be caused if the turntable is too close to the speaker systems. Allow for adequate spacing when installing.

Using the MIC/PHONO 2 Level Control

The LEVEL control adjusts the sensitivity of the PHONO 2 jacks in the range from 2.5mV to 5mV and MIC jack in the range from 7.5mV to 15mV. For example, if a high output voltage cartridge is connected to PHONO 2 jacks, the control can be used to match its level with that of the cartridge connected to the PHONO 1 jacks.

EMPLOYING TUNER

1. Set the FUNCTION switch to TUNER.
2. Tune in desired station on tuner.
3. Adjust VOLUME, BASS & TREBLE controls for desired volume and tone.

EMPLOYING AUX COMPONENTS

Auxiliary program sources, such as a cartridge tape player deck, can be connected to the AUX jacks.

1. Set the FUNCTION switch to AUX.
2. Operate the program source.
3. Adjust the VOLUME, BASS & TREBLE controls for desired volume and tone.

USING THE MICROPHONE

1. Connect the microphone to the MIC jack on the rear panel.
2. Set the FUNCTION switch to MIC/PHONO 2.
3. Adjust the sound level by turning the VOLUME control gradually to the right.

NOTES:

- *You should use a high impedance (above 20kΩ) dynamic type microphone with a standard 6mm diameter phone plug. Pioneer markets a wide variety of high performance microphones for your selection.*
- *Under certain conditions, a microphone gives rise to howling or feedback noise. Take care not to raise the volume too high when the microphone is close to the speaker system, or in a room with a great deal of resonance. The microphone will perform most effectively with TREBLE and BASS controls at their midway positions.*
- *While using the microphone, only microphone sound will be heard through the left and right speakers.*

Protection Circuit

- After turning on the power of the SA-8500, 3 ~ 8 seconds will elapse before sound is obtained from the speakers. This is due to the operation of the built-in protection and muting circuit. It serves to both prevent switching noise when the power is turned on or off, and to protect the speakers in event DC occurs in the output.
- Operation of the internal relay during playing will cause a continuous clicking noise.
  This would most likely be caused by speaker terminal shorting or overload (speaker impedance less than 4Ω). The protection circuit functions automatically in this type of case to disconnect the speaker terminals and safeguard the transistors and speakers. The circuit is self-resetting and after the cause of the trouble has been corrected, it will return to the normal condition.

SELECTING STEREO COMPONENTS

The SA-8500 forms the nucleus of a high performance stereophonic system. One of its primary advantages is that it allows the user to compose, modify and upgrade his system at any time according to personal preference and budget limitations. Pioneer manufactures a full line of top performance components which are compatible with the SA-8500. They are recommended for obtaining maximum value from your system investment.

Turntable

Main factors in selecting a turntable include wow & flutter, S/N, frequency response and ease of operation. Take the time to choose carefully.

Tuner

A good stereo tuner often forms the principal listening source in terms of time. Among the specifications to be considered are stability, selectivity, S/N, separation, and image rejection.

Tape Deck

Special care is recommended in selecting a tape deck since both electronic and mechanical excellence are required. Wow & flutter, S/N, recording & playback response, and operational ease are among the important considerations.

Speaker System

Both left and right channel speaker systems should be of the same brand and model. Output sound pressure, frequency response, crossover response, directionality and impedance are listed among the specifications encountered. Impedance of 4 ~ 16Ω is recommended for use with the SA-8500. However, if 2 sets of speaker systems (A & B) are contemplated, choose from among 8 or 16 ohm systems only.

The very broad range of composition and styles provides great latitude for selecting speaker systems. If space is limited, a compact bookshelf system can be considered, while full size floor standing models often appeal to those with less restricted listening rooms. Your Pioneer dealer will be glad to assist you in choosing the proper speaker system for your particular taste and listening room.

EMPLOYING TAPE DECK

TAPE PLAYBACK

1. Set the TAPE MONITOR switch to 1 if the tape deck is connected to the TAPE 1 jacks, and to 2 if it is connected to the TAPE 2 jacks.
2. Play tape on tape deck.
3. Adjust VOLUME, BASS & TREBLE controls for desired volume and tone.

NOTES:
1. Be sure to set the TAPE MONITOR switch to SOURCE when not playing tape.
2. FUNCTION switch setting is irrelevant when playing tape.

TAPE RECORDING

1. Set FUNCTION switch to the source to be recorded (PHONO, TUNER, etc.).
2. Operate program source.
3. Adjust recording levels with the controls of the tape deck and proceed with recording.

NOTE:
Set DUPLICATE switch to OFF during recording.

Monitoring Recording Conditions

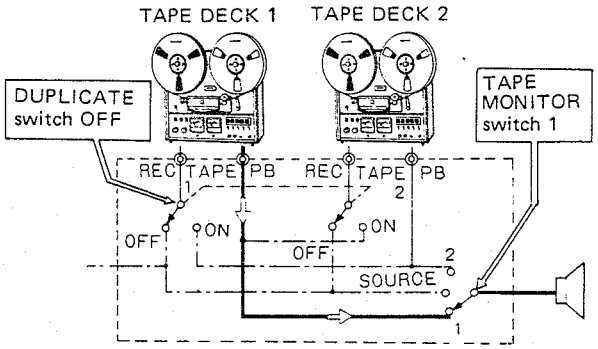
If the tape deck is a 3-head type recording conditions can be monitored through the speakers by setting the TAPE MONITOR switch to 1 (or 2). Both recording and playback connections must be made in this case.

TAPE DUPLICATION & EDITING

By employing 2 tape decks, the desired material from a previously recorded tape can be edited onto a second tape. A personal tape library can be compiled in this manner.

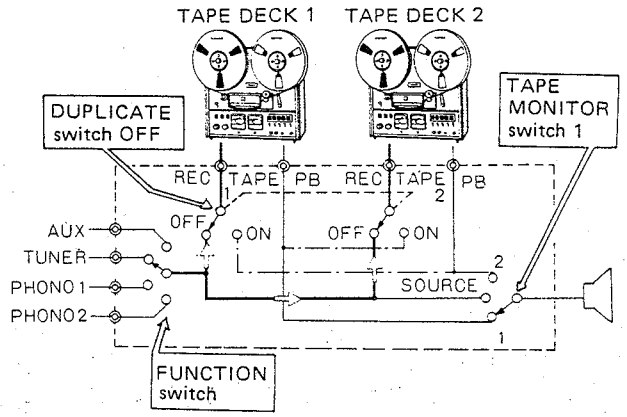
1. Connect 2 tape decks as shown in Fig. 8.
2. Set the TAPE DUPLICATE switch to ON.
3. On one tape deck (1 or 2) playback the pre-recorded tape, and perform recording with the other deck.

- The recording can be monitored during duplication. Set the TAPE MONITOR switch to 1(or 2) according to the deck being used for recording 1 (or 2).



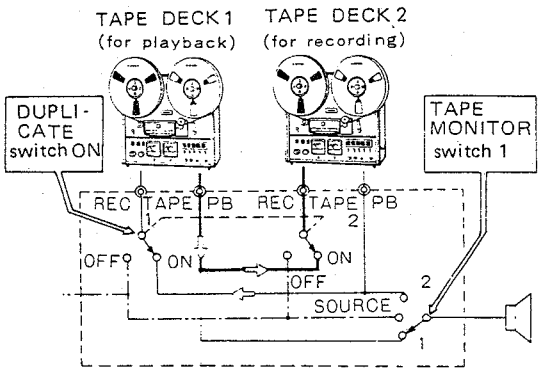
Tape playback: Playback signal enters TAPE 1 (or 2) PB jacks, passes through TAPE MONITOR switch 1 (or 2) and is heard from the speakers.

Fig. 6



Tape recording: The input signal selected by the FUNCTION switch is always present at a fixed level at the TAPE 1 & 2 REC jacks. Monitoring can be performed at this time by setting the TAPE MONITOR switch to 1 or 2, according to the TAPE jacks being used for recording.

Fig. 7



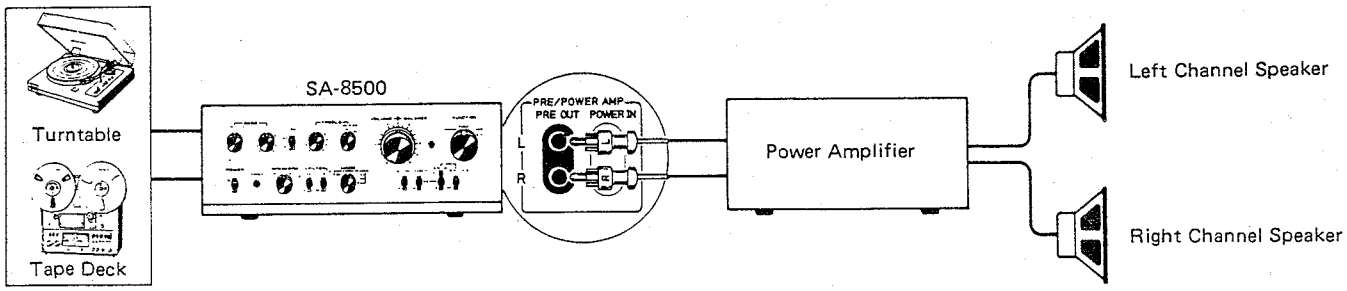
Duplication: Playback signal from tape deck 1 in the figure enters via TAPE 1 PB jacks, passes through DUPLICATE switch ON, and is recorded by tape deck 2. This can also be performed in reverse, i.e: playback with tape deck 2 and record with tape deck 1.

Fig. 8

EMPLOYING PRE OUT & POWER IN JACKS

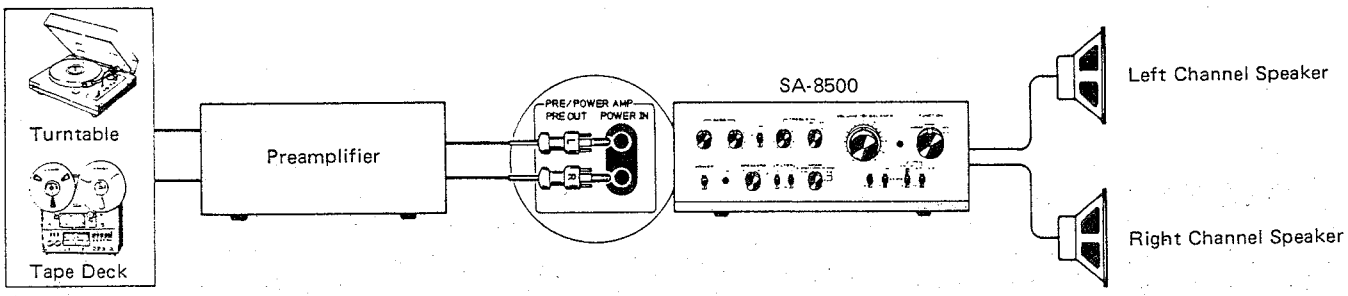
INDEPENDENT PREAMPLIFIER FUNCTION

The preamplifier section of the SA-8500 can be used independently to drive an external power amplifier. This allows comparison listening between the SA-8500 built-in power amplifier and a home-built or other separate type power amplifier.



INDEPENDENT AMPLIFIER FUNCTION

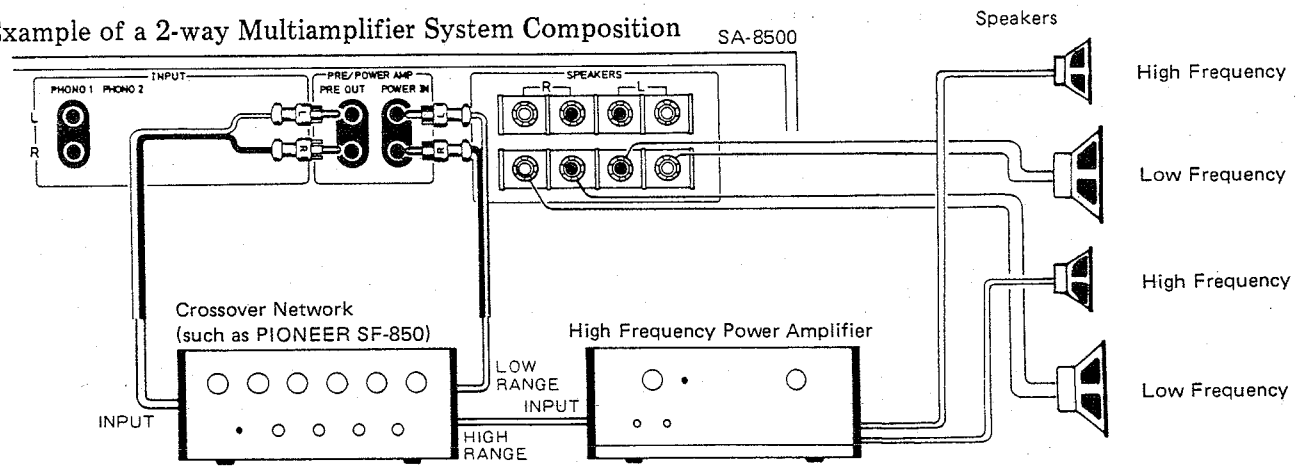
An external preamplifier can also be connected to the SA-8500 power amplifier section to compose a stereo system.



MULTIAMPLIFIER SYSTEM COMPOSITION

A multiamplifier stereophonic system can be composed by employing a separately sold power amplifier and crossover network. This type of system divides the audible frequency spectrum into sections and amplifies each section via its own amplifier. Significant improvement in such factors as intermodulation distortion forms a major advantage of these systems.

Example of a 2-way Multiamplifier System Composition



SPECIFICATIONS

Simiconductors

Transistors 45
Diodes 27

Power Amplifier Section

Circuitry . . . . . 1-stage differential amplifiers. Direct coupled OCL.

60 watts* per channel, min. RMS, at 8 ohms or 75 watts* per channel at 4 ohms from 20 Hertz to 20,000 Hertz with no more than 0.1% total harmonic distortion.

Continuous Power Output at 1,000 Hertz
(Both channels driven) . . . . 65 watts per channel (8 ohms)
85 watts per channel (4 ohms)
Total Harmonic Distortion at 20 Hertz to 20,000 Hertz
(Continuous Rated Power Output) . . . . . No more than 0.1%
(30 watts per channel Power Output, 8 ohms) . . . . . No more than 0.05%
(1 watt per channel Power Output, 8 ohms) . . . . . No more than 0.05%
Intermodulation Distortion at 20 Hertz to 20,000 Hertz
(Continuous Rated Power Output) . . . . . No more than 0.1%
(30 watts per channel Power Output, 8 ohms) . . . . . No more than 0.05%
(1 watt per channel Power Output, 8 ohms) . . . . . No more than 0.05%
Frequency Response . . . . . 10 Hertz to 80,000 Hertz $^{+0}_{-1}$dB
Input : Sensitivity/Impedance
(POWER AMP IN) . . . . . 1V/50k ohms
Output : Speaker . . . . . A, B, A+B
Headphone . . . . . Low Impedance
Damping Factor
(20 Hertz to 20,000 Hertz, 8 ohms) 30
Hum and Noise
(IHF, short-circuited, A Network) 100dB

Preamplifier Section

Circuitry
Equalizer amplifier . . . . . 3-stage direct-coupled amplifier.
Control amplifier . . . . . 2-stage direct-coupled NFB type.
Input : Sensitivity/Impedance
PHONO 1 . . . . . 2.5mV/50k ohms
PHONO 2 . . . . . 2.5mV~5mV/50k ohms
MIC . . . . . 7.5mV~15mV/85k ohms
TUNER . . . . . 150mV/50k ohms
AUX . . . . . 150mV/50k ohms
TAPE PB 1 . . . . . 150mV/50k ohms
TAPE PB 2 . . . . . 150mV/50k ohms
TAPE PB 2 (DIN connector) . . . . . 150mV/50k ohms
PHONO Overload Level (T.H.D 0.1%)
PHONO 1 . . . . . 200mV (1,000 Hertz)
PHONO 2 . . . . . 200mV~400mV (1,000 Hertz)
Output : Level/Impedance
TAPE REC 1 . . . . . 150mV
TAPE REC 2 (DIN connector) . . . . . 30mV/80k ohms
PRE OUT . . . . . 1V/1k ohms
Total Harmonic Distortion at
20 Hertz to 20,000 Hertz . . . No more than 0.05%
Frequency Response
PHONO (RIAA equalization). 30 Hertz to 15,000 Hertz ±0.3dB
TUNER, AUX, TAPE PB . . . 7 Hertz to 40,000 Hertz $^{+0}_{-1}$ dB
Tone Control
BASS . . . . . SUB ±6dB by 2dB step (50 Hertz)
MAIN ±8dB by 2dB step (100 Hertz)
TREBLE . . . . . SUB ±6dB by 2dB step (20,000 Hertz)
MAIN ±8dB by 2dB step (10,000 Hertz)
Filter
LOW . . . . . 30 Hertz (12dB/oct)
HIGH . . . . . 8,000 Hertz (12dB/oct)
Loudness Contour
(Volume control set at −40dB position) . . . . . +8.5dB (100Hz)
+4dB (10,000Hz)
Hum and Noise (IHF, Short-circuited, A Network)
PHONO 1 and 2 . . . . . 70dB
MIC 65dB
TUNER, AUX, TAPE PB . . . 90dB
Muting . . . . . 0, −20dB

Miscellaneous

Power Requirements . . . . . AC 220V 50/60 Hertz or 110, 120, 130, 220 and 240V (Switchable) 50/60 Hertz
Power Consumption . . . . . ~~240 watts~~ 440 watts
Dimensions . . . . . 420 (W) x 150 (H) x 345 (D) mm
16-9/16 x 5-7/8 x 13-9/16 in.
Weight : Without Package . . . 13kg (29 lb 11oz)
With Package . . . . . 14.5kg (31 lb 4 oz)

Furnished Parts

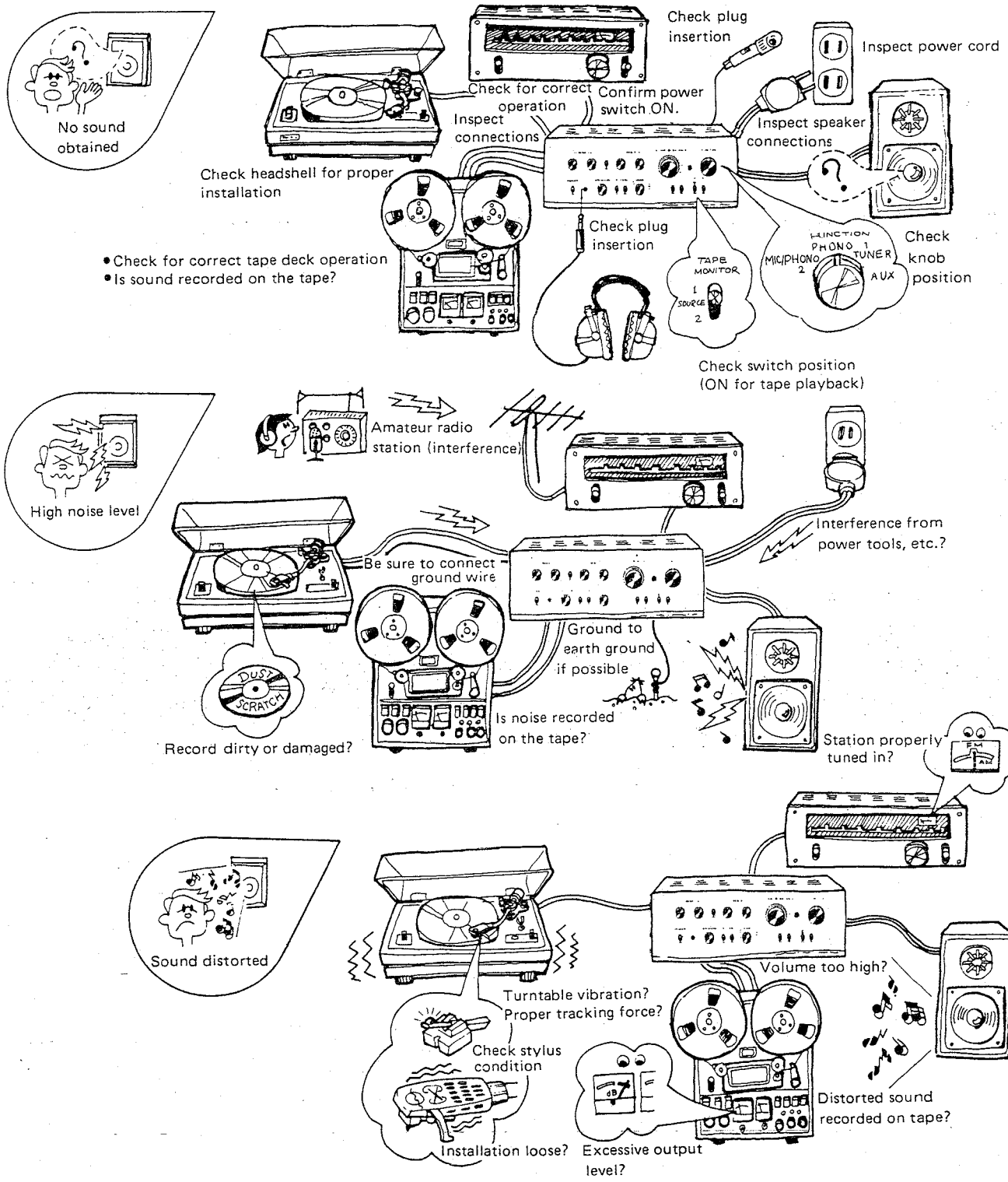
Connection Cord with Pin Plugs . 1
Operating Instructions 1
Fuse 2.5A 1
Fuse 5A . . . . . 1 (5-line voltage model)

*Measured pursuant to Federal Trade Commission's Trade Regulation rule on Power Output Claims for Amplifiers.

NOTE:
Specifications and the design subject to possible modification without notice due to improvements.

CONDITIONS FREQUENTLY MISTAKEN FOR MALFUNCTION

If you think that there is a defect, please check the following steps.
If this does not help, please inform your Pioneer Authorized Service Center, giving product name and symptoms.



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